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Some of the specific learning and motivational variables involved in desensitization therapy were investigated. Two factors were considered: group interaction as a source of motivation and discrimination learning, and the effect of a progressive hierarchy of problem-related situations upon anxiety arousal. The design of the study involved a 2x2 paradigm with a no-contact control group. Groups were formed according to two dimensions: the amount of group interaction and the nature of the desensitization hierarchy. Subjects were 25 psychology students in the upper 30% of the Test Anxiety Scale (TAS). Results indicated that test anxious college students completing a short-term program of group desensitization tended to report more anxiety reduction and achieve a greater increase in grade point average (GPA) than students with equivalent TAS scores who did not participate in a desensitization program. Motivational variables were more plausible than discrimination learning variables. The lack of significant differences between Progressive and High Anxious groups brings into question the necessity of using a progressive hierarchy when treating test anxiety and adds to the evidence against the advantage of using displacement to resolve certain conflict situations. (PS)

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GROUP DESENSITIZATION OF TEST ANXIETY*

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The purpose of this study was to investigate some of the specific learning and motivational variables involved in desensitization therapy, as well as to add to the body of validity data currently available. Two factors were considered in the present study.

Group Interaction as a Source of Motivation and Discrimination Learning

The most obvious reason for doing desensitization with groups rather than individuals is economy. Group treatment may provide benefits in addition. It is possible that there are non-specific treatment effects accruing from group processes other than formal desensitization (Lazarus, 1961). Three particularly promising therapeutic sources within group interaction are the opportunity to learn behavioral discrimination, the motivational incentives provided by hearing of other persons' progress, and additional desensitization derived from discussing anxiety provoking situations in an atmosphere conducive to relaxation.

The issue we are concerned with here is whether group desensitization may be considered individual therapy in groups, or whether group treatment has additional qualities which qualify it to be conceived as therapy by groups (Lazarus, in press). In the current study, desensitization was presented separately and also in conjunction with discussion in order to investigate this issue.

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The Effect of Using a Progressive Hierarchy

A progressive hierarchy consists of a series of problem-related situations, introduced in ascending order of anxiety arousal. The rationale for beginning with slightly anxiety-arousing situations and gradually introducing more intense items is that the relaxation response must be stronger than the anxiety response in order to reciprocally inhibit anxiety. If the anxiety elicited is too strong relaxation cannot successfully inhibit the anxiety.

There are some similarities between the reciprocal inhibition rationale and the construct of displacement as a facilitating factor in recovery from conflict (Murray and Berkun, 1955). Relaxation may be viewed as a response consonant with approach, and anxiety may be considered an avoidance response. The initial presentation of low anxious scenes provides a mildly aversive or displaced situation in which the relaxation response is stronger than the anxiety response. Displacement theoretically facilitates extinction or counter-conditioning of an anxiety response.

Although this conception of displacement as a facilitating agent seems to make intuitive sense, there have been some theoretical and empirical doubts expressed about this hypothesis, raising questions about its validity (Berkun, 1957; Elder, Noblin and Maher, 1961; Taylor and Maher, 1959; Taylor and Rennie, 1961). Martin and Hamburg (1966), working with rats, found that providing an opportunity for displacement did not facilitate extinction of an avoidance response in an approach-avoidance conflict situation. Thus, there is some uncertainty regarding the efficacy of displacement as a "therapeutic" agent, at least with rats.

What does this mean in practical terms? If displacement does not necessarily facilitate recovery from anxiety reactions, there may be no need to spend time and energy progressively moving from low to high anxiety

items on the hierarchy. It may take more trials to master a single strong anxiety item, when it is presented without the benefit of practice on less intense items, but the total number of trials necessary to achieve overall inhibition of anxiety may be fewer.

METHOD

Experimental Design

The basic design of the study involved a 2 x 2 paradigm with a no-contact control group. Groups were formed according to two dimensions: the amount of group interaction and the nature of the desensitization hierarchy. There were two conditions for each condition. Ss were either encouraged to interact with other members of the group about issues related to test anxiety problems and alternative means of handling these problems or in the other condition, Ss were not given an opportunity to interact within the group. The non-interaction Ss were asked to write out their questions which were answered, without specific reference to the question, by the experimenter. The amount of time spent in formal group interaction or non-interaction, and the degree of participation by the group leader were regulated by the experimenter in order to insure equivalency among groups.

The hierarchy dimensions consisted of a conventional progressive hierarchy condition in which Ss were asked to visualize all items in the hierarchy, beginning with the least anxiety provoking scenes and systematically proceeding up the scale, and a high anxiety hierarchy condition, in which Ss visualized only the most anxiety-provoking scenes (upper one-third of the hierarchy). Ss constructed their hierarchies by individually ranking a predetermined list of twelve scenes, according to the amount of anxiety the scene evoked.

Ss in the progressive hierarchy groups were asked to visualize all items on the hierarchy, while Ss in the high anxiety groups visualized only their four most severe anxiety scenes.

The no-contact control group consisted of Ss selected randomly from the upper 30% of the Test Anxiety Scale (TAS) scores of students in the introductory psychology class. These students were not invited to attend the class, but participated in an experiment to fulfill a class requirement in which they were given pre and post measures during the same weeks the experimental Ss received their measures.

Procedure

Twenty-five introductory psychology students, in the upper 30% of the TAS distribution, responded affirmatively to an invitation to participate in a course designed for test anxiety reduction. They were randomly assigned to four experimental groups. The groups met with the author, who served as instructor, and an assistant who coordinated various measures but did not speak during class sessions. Each group met twice per week for a total of twelve sessions. Thirteen students completed the entire course. Six other students, who completed half of the course, were used on a post-hoc basis to study the effects of minimal desensitization.

The first two sessions were spent training students to relax, using shorter instructions as students became more proficient at relaxing.

Explanation and practice of the visualization aspect of desensitization were presented in the third session. Students were told to begin by visualizing the first scene in the hierarchy as vividly as possible. If they experienced any anxiety they were to stop thinking of the scene and attempt to relax themselves until further instructions were given. Subjects were in-

structed to visualize each scene until no anxiety had been experienced for two consecutive trials, before moving to the next scene. Scenes were visualized in ascending order, going from low anxiety to high anxiety scenes, with Progressive Hierarchy subjects beginning with scene #1 and High Anxiety Hierarchy subjects starting at scene #9. Students who successfully completed the hierarchy were told to repeat their hierarchy.

Five 30 second visualization trials were presented after each six-to-eight minute set of relaxation instructions. Each trial was separated by one minute of relaxation instructions. Ss recorded the items visualized, and indicated whether or not they experienced anxiety immediately after each set of trials.

Sessions were divided into desensitization and discussion or lecture-writing periods, with discussion periods (Group Interaction) being equivalent in time to the other groups' lecture writing periods (Group Non-Interaction). Topics of discussions and lectures included how to identify maladaptive patterns of behavior related to studying and tests, self-confidence as a learned factor influencing test anxiety, means of coping with test anxiety utilizing relaxation and re-learning, as well as problems and progress of formal desensitization and students' reaction to tests.

Pre and post measures were obtained for the TAS, and single question multiple choice self-rating scales constructed by the author. Experimental Ss also took a nine item Attraction to Group Scale (Goldstein, 1966) after the third session and at the end of the course and a five item multiple choice scale measuring attraction toward various components of treatment (Cohen and Marcus, 1966) at the completion of the course. Grade point average were available for the semester during which the course was given and for the previous semester.

RESULTS

Initial TAS scores were used as the subject selection criterion. There were no significant differences between the experimental and control group on the pre experimental TAS measures, nor were there any significant differences among experimental groups.

 Insert Table 1 About Here

Experimental Ss reported significantly greater test anxiety reduction than the no-contact control subjects ($t = 2.21$, 1, 19 d.f., $p < .05$). A two-way analysis of variance for the experimental groups, revealed a significant main effect for the factor of Group Interaction, with subjects experiencing Group Interaction reporting more reduction than those subjects in the Non-Interaction condition ($F = 12.03$, 1, 9 d.f., $P < .01$).

There were no significant main effects for the hierarchy variable, nor was there a significant interaction.

Since there were no significant differences among the experimental and control groups or among the four experimental groups on grade point averages for the semester prior to the desensitization course, it seemed justifiable to compare these groups on grade point changes from the semester prior to desensitization to the semester in which they participated in the course. The mean grade point changes for Experimental Ss was greater than the mean changes of Control Ss ($t = 1.74$, 1, 18 d.f., $p < .10$).

Mean anticipation of test anxiety reduction increased significantly from the pre course measurement to the response given after the third session for experimental Ss ($t = -3.40$, 12 d.f., $p .01$). Although there were no pre experimental differences in expectancy between the experimental

and control groups, the experimental subjects tended to anticipate more test anxiety reduction than the control subjects after taking the course ($t = 1.91$, 1, 19 d.f., $p < .10$).

On the attraction measures, there were no significant pre to post changes in attractiveness among the experimental Ss. On Goldstein's Attraction to Group Scale, Group Interaction Ss had a tendency to rate their group as more attractive than Group Non-Interaction Ss, though this difference did not reach significance ($F = 3.16$, 19 df; $p < .15$). The Group Interaction - High Anxious group expressed more attraction toward the components of treatment than the Group Interaction - Progressive group ($F = 11.91$, 3, 9 d.f., $p < .05$).

Each 30 second visualization exposure was considered a trial. Visualization of a scene with complete absence of anxiety served as a criterion of success, and two consecutive successes were required to move the next scene. In order to compare the efficiency of the Progressive and High Anxious Hierarchy methods, an analysis of variance test was performed on the number of trials required for each subject to complete the hierarchy. There was a main effect for Hierarchy condition, with the Progressive groups requiring significantly more trials than the High Anxious hierarchy groups ($F = 22.12$, 1, 9 d.f., $p < .001$).

DISCUSSION

The present study indicates that test anxious college students completing a short-term program of group desensitization tend to report more anxiety reduction and achieve a greater increase in grade point average than students with equivalent TAS scores who are not given an opportunity to participate in a desensitization program. It also was found among desen-

sitization subjects that students who were encouraged to interact with each other and the instructor, reported more test anxiety reduction than students in minimal interaction groups, though there were no significant differences between groups in grade point changes from the semester prior to desensitization to the semester in which the course was taken. At least in terms of reported anxiety reduction, variables other than formal desensitization may be operating to produce change.

Motivational variables seem more plausible than discrimination learning variables in this instance, since most of the relevant material was presented by the instructor in the non-interaction condition.

There were no significant differences between Progressive and High Anxious groups, bringing into question the necessity of using a progressive hierarchy when treating test anxiety and adding to the growing body of evidence against the advantage of utilizing displacement in resolving certain conflict situations.

Visual imagery or mediational stimuli, as it is sometimes labelled, seems to be an important factor in the development, maintenance and reduction of anxiety responses. Though Wolpe's formal theory and method have been questioned, his utilization of mediational behavior in a controlled setting is an important contribution to the study of maladaptive behavior. For instance, Hogan and Kirchner (1966) using implosive therapy, a technique emphasizing visualization with maximal anxiety, report reduction in rat phobic behavior comparable to the results of desensitization advocates. Assuming that factors in addition to placebo are operating (Davison, 1965; Lang et al., 1965; Paul, 1966), one might attempt to find process elements common to both of these procedures. The most obvious mutual feature is repeated vivid visualization of anxiety-provoking scenes in a realistically non-threatening environment.

Inferences drawn from these findings should be tentative. Problems of experimental design, including the lack of a placebo or wait-control group, the small number of subjects in each group, and the fact that the author also served as instructor, limit the strength of the results. Difficulties in measuring the relatively complex syndrome of test anxiety, small magnitudes of differences among groups in some instances and theoretical weaknesses in the desensitization model combine to foster caution in interpreting the data. Also, any generalization of results from an investigation of test anxiety in volunteer college students to other anxiety problems should be made cautiously. Procedures applicable to the treatment of test anxiety may not be appropriate for more severe psychopathology.

TABLE 1

Mean Scores on Anxiety, Grade Point, Expectancy

Attraction and Hierarchy Trials Measures

	1-P (N-3)	1-HA (N-3)	NI-P (N-4)	NI-HA (N-3)	All Exp. (N-13)	Control (N-13)
Pretreatment TAS	12.33	9.33	10.00	12.00	10.85	10.00
Pre Post TAS diff.	-5.00	-4.67	-3.00	0.33	-3.08	-0.75
Course Test Anxiety Reduction	3.67	6.67	5.50	4.00	5.00	
Pre treatment grade point average	1.68	1.37	1.58	0.89	1.28	1.36
Pre-post grade point diff.	0.01	0.29	0.41	0.78	0.44	0.08
Pre treatment expectancy	2.67	3.00	2.00	3.33	2.75	3.00
Third Session expectancy	4.33	6.67	4.00	5.67	5.08	
Post treatment expectancy	2.33	2.33	5.00	4.67	3.69	2.13
Third Session Attraction to Group	5.00	10.33	8.50	8.67	8.15	
Post Treatment Attraction to Group	4.33	11.00	5.00	5.00	6.23	
Post Treatment Attraction to Treatment*	16.67	9.00	11.00	15.00	12.77	
No. of Trials to complete hierarchy first time	41.00	34.33	61.00	27.00	42.08	

Note: *For this measure only, a high score indicates low attraction

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